

PATENT APPLICATION
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Yasumasa KAWABE, et al.

Appln. No.: 09/295,329

Group Art Unit: 1752

Confirmation No.: Not Assigned

Examiner: Y. Clarke

Filed: April 21, 1999

For: POSITIVE PHOTSENSITIVE RESIN COMPOSITION

DECLARATION UNDER 37 C.F.R. § 1.132

Commissioner for Patents
Washington, D.C. 20231

Sir:

I, Yasimasa Kawabe, declare and state that:

I graduated from Shinshu University, Faculty of Engineering, Course of Synthetic Chemistry in March, 1980.

In April of 1980, I was employed by Kurabo Co., Ltd, and since that time have been engaged in the study of physical properties of polymers.

From September of 1983 to March of 1986, I studied synthesis of electroconductive polymers at the polymer Laboratory of Aichi Institute of Technology, Course of Applied Chemistry as a research student.

Since April of 1986, I have been employed by Fuji Photo Film Co., Ltd., and engaged in the study of photopolymers and photo-resists at the Yoshida-minami Laboratories of said Company.

The following comparative experimentation was conducted by me or under my direction and control.

Comparative Experimentation

I. Comparison Between the Surfactant of the Present Invention and the Surfactant other than that of the Present Invention.

The use of a surfactant, W-5 (Megafac F171), which is within the scope of the present invention among the surfactant described in Suwa, was compared with the use of a surfactant, W-4 (polyoxyethylene nonyl phenyl ether), which is outside of the scope of the present invention.

The samples of the positive photosensitive resin composition were prepared in the same manner as in Examples 1a to 6a of Table 1 in the present specification, except that the formulation of the composition shown in Table A below was used.

The obtained samples were evaluated in the same manner as in shown in Tables 2 and 3 of the present specification.

The results are shown in Table A' below.

Table A

	<u>Polymer</u>	<u>Photo-Acid Generator</u>	<u>Nitrogen Containing Basic Compound</u>	<u>Surfactant</u>	<u>Solvents</u>
Example a	A	PAG-1	N-1	W-5	S-1
Example b	D	PAG-1	N-2	W-5	S-1
Comparative Example a'	A	PAG-1	N-1	W-4	S-1
Comparative Example b'	D	PAG-1	N-2	W-4	S-1

Table A'

	<u>Development Defect I</u>	<u>Development Defect II</u>	<u>Residual Film Rate</u> (%)	<u>Profile</u>
Example a	5	12	99.3	A
Example b	3	9	99.6	A
Comparative Example a'	5	12	94.6	B
Comparative Example b'	6	9	95.2	B

As is apparent from the comparison between Example a and Comparative Example a' in Tables A and A', when the surfactant which is within the scope of the preset invention is used, unexpected and excellent effects in the residual film rate and profile are obtained. However, when Surfactant W-4 described in Suwa, which is outside of the scope of the present invention, is used, the excellent effect in the residual film rate and profile can not be obtained.

Also, as is apparent from the comparison between Example b and Comparative Example b', in which Polymer D is used, when Surfactant W-4 described and used in Suwa is used, the specific effect of the present invention can not be obtained, but the surfactant (i.e., Surfactant W-5) of the present invention functions to unexpectedly improve the residual film rate and profile.

(II) Comparison Between the Solvent Of the Present Invention and the Solvent other than that of the Present Invention.

The samples of the positive photosensitive resin composition were prepared in the same manner as in Examples 1a to 6a of Table 4 in the present specification, except that the formulation of the composition shown in Table B below was used.

The obtained samples were evaluated in the same manner as is shown in Table 2 of the present specification.

The results are shown in Table B' below.

Table B

	<u>Polymer</u>	<u>Photo-Acid Generator</u>	<u>Nitrogen- Containing Basic Compound</u>	<u>Surfactant</u>	<u>Solvent (weight ratio)</u>
Example c	A	PAG-1	N-1	W-5	S-3/S-6 (70/30)
Comparative Example c'-1	A	PAG-1	N-1	W-5	S-3/S-6 (30/70)
Comparative Example c'-2	D	PAG-1	N-1	W-5	S-3/S-6 (30/70)
Comparative Example c'-3	A	PAG-1	N-1	W-5	S-4 (100)

Table B'

	<u>Development Defect I</u>	<u>Development Defect II</u>
Example c	0	0
Comparative Example c'1	45	48
Comparative Example c'-2	39	40
Comparative Example c'-3	- (failure since polymer was not dissolved)	-

As is apparent from the comparison between Example c and Comparative Example c'-1 prepared by using the weight ratio (S-3/S-6) of the solvent described in Suwa, when the solvent ratio which is within the scope of the present invention is selectively used, unexpected and extremely excellent effects in the Development Defect-I and Development Defect-II are obtained. However, when the solvent ratio which is outside of the scope of the present invention is used, the excellent effect in the Development Defect-I and Development Defect-II can not be obtained.

Also, it is clearly seen from the comparison between Example c and Comparative Example c'-3, prepared by using the solvent described in Niki, that the unexpected and extremely specific effect of the present invention can be obtained by using the solvent of the present invention.

Further, it is clearly seen from the result of Comparative Example c'-2 that even if Resin D of the present invention is used in the system of using the solvent which is outside of the scope of the present invention, the excellent effect of the present invention can not be obtained.

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false

Declaration Under 37 C.F.R. §1.132
U.S. Appln. No. 09/295,329

statements may jeopardize the validity of the application or any patent issuing thereon.

Date: _____

Yasimasa Kawabe